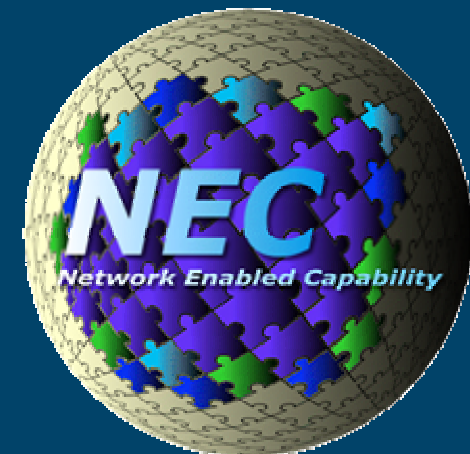# Operational analysis of Way of Command in the ERA of Network Enabled Capability

John Montgomery

9th ICCRTS, Copenhagen
14 - 16 September 2004

"Never express yourself more clearly than you are able to think" - Niels Bohr

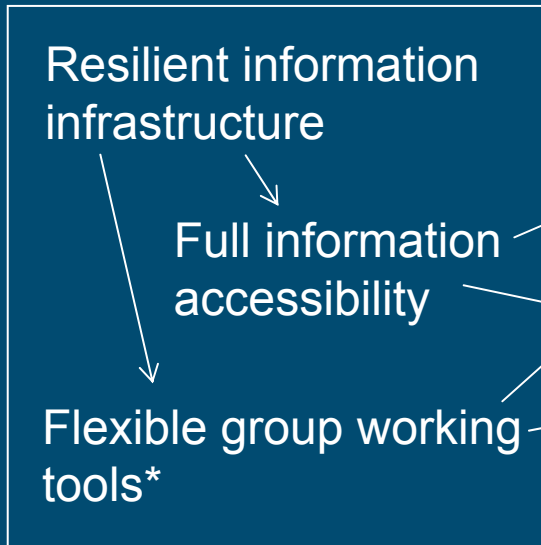Dstl is part of the Ministry of Defence

Topics

- Background

  – key command-related factors and influences

- Network-enabled Command

  – where Command fits within the NEC concept

  – where NEC fits within Way of Command

- Requirements for metrics and analysis methods

  – for specific C2 relationships

  – some challenging issues

- Conclusions and way ahead
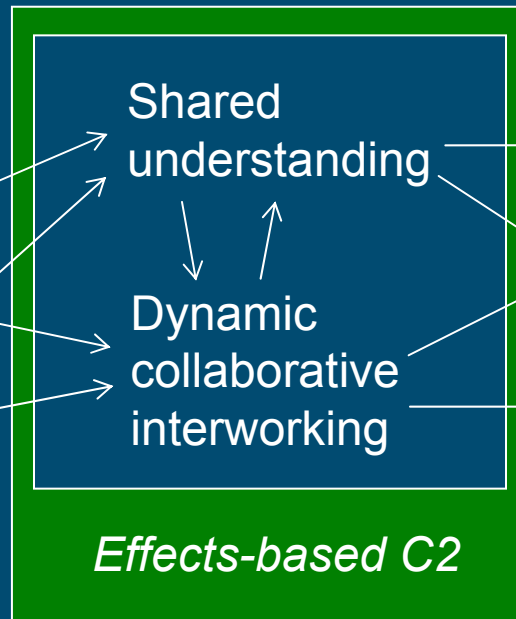
Command-related factors and influences

- De-centralisation

  – operational complexity, responsiveness, innovation, trust, horizontal information flow, manoeuvrist doctrine

- Culture

  – common understanding, trust (in individuals, teams and systems)

- Digitisation

  – information accessibility, shared awareness, collaborative working

- Agility

  – Manoeuvrist doctrine, responsiveness, flexibility, robustness and adaptability

Where Command fits within NEC

Information infrastructure

Resilient information infrastructure

Full information accessibility

Flexible group working tools*

Command and control

Shared understanding

Dynamic collaborative interworking

Effects-based C2

Military capability

Effects synchronisation

Agile mission grouping

Effects-based operations
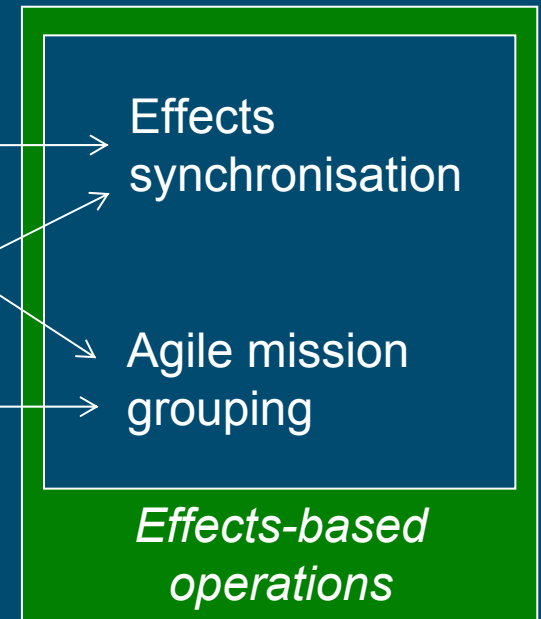
* Not an NEC Theme, but a key supporting equipment capability

How NEC relates to Way of Command

Culture → Mission Command

Creativity (tactical innovation)

Freedom of manoeuvre

Optimum effect and tempo

Assured access to the battlespace

Trust → Mission Command

Initiative

Command Intent

Dynamic collaborative interworking

Agile Mission Grouping

Efficient use of resources

Effects synchronisation

Shared understanding

NEC Themes
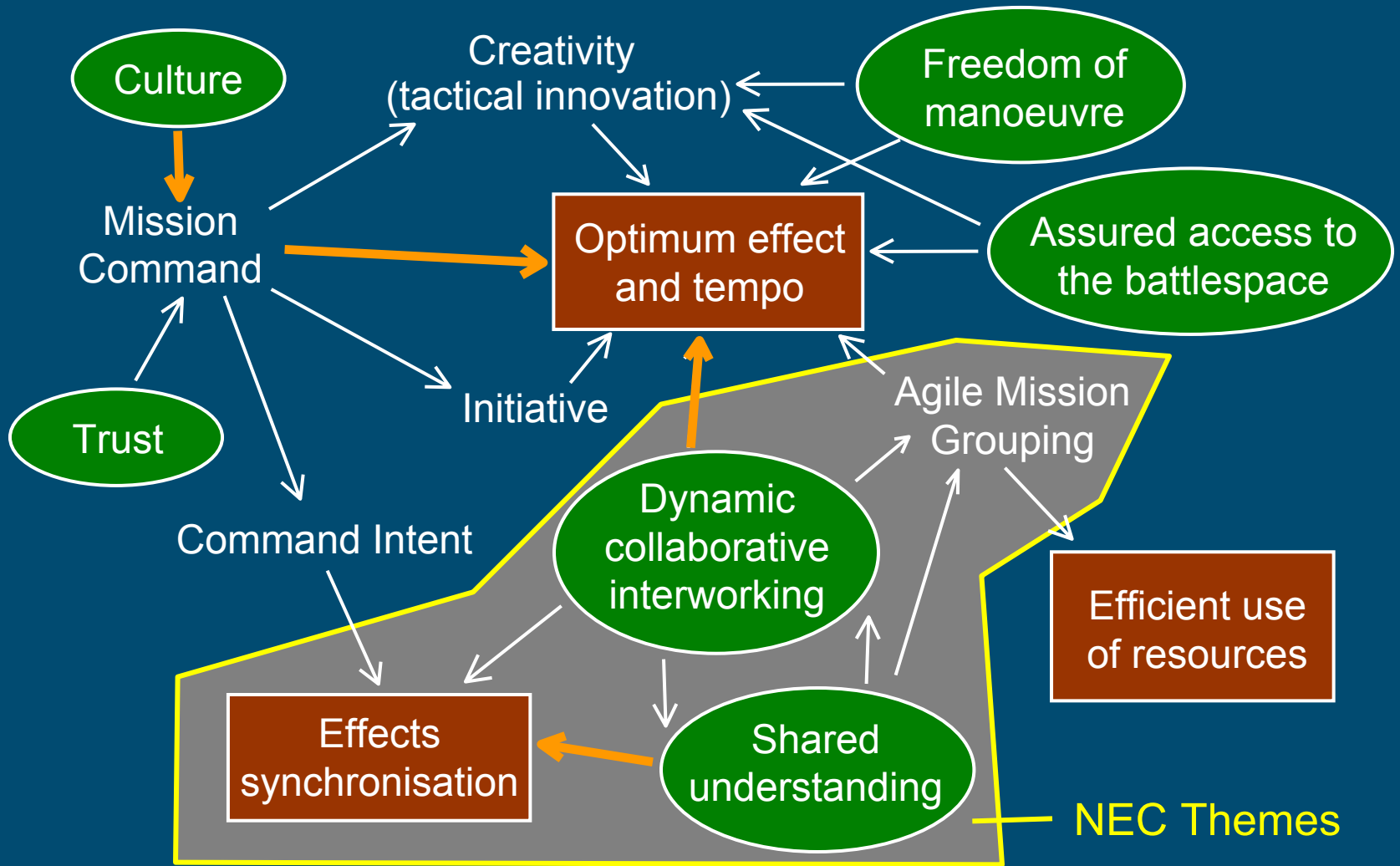
"If you cannot measure it, you cannot improve it"
- William Thomson (Lord Kelvin)

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Analysis of causal link - example 1

Cause	Culture (supportive of de-centralised command)	Level of trust in subordinates. Focus on Mission Command within training.
Effect	Mission Command	Subjective view of subordinate Commander of degree of freedom. Relevant features in the issued orders.
Relationship	Mission Command can only thrive in a supportive culture. New legislation may be needed to protect junior commanders.	Cognitive mapping study of social aspects of NEC.

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Analysis of causal link - example 2

Cause	Mission Command	Subjective view of subordinate Commander of degree of freedom. Relevant features in the issued orders.
Effect	Optimum tempo	Subjective assessment by peers. Effective use of forces under control. Comparison of OODA loops around specific event sequences.
Relationship	Delegated decision making facilitates responsiveness and allows OPTEMPO to be controlled by those close to the action.	Models of communication across command hierarchies, wargaming and other HQ experiments, observation, agent-based simulations anecdotal evidence from serving commanders or 'grey beards'.

Analysis of causal link - example 3

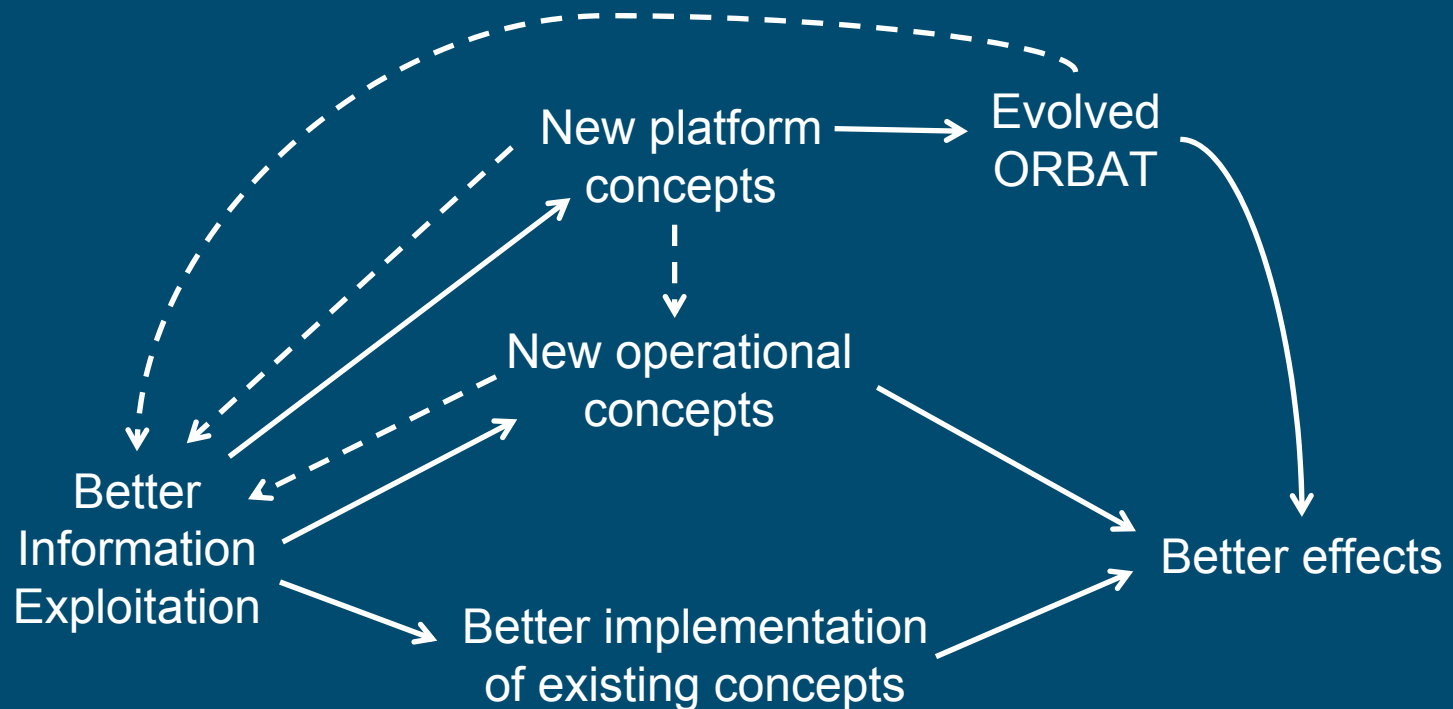| Cause	Dynamic collaborative interworking	Instrumenting the work processes to measure the degree of agility and extent of collaboration.
Effect	Optimum tempo	Subjective assessment by peers. Effective use of forces under control. Comparison of OODA loops around specific event sequences.
Relationship	Dynamic collaboration can rapidly bring expertise to bear and optimise response, in both timing and choice of effect(s).	Experimentation (e.g. MNE series), HQ modelling, wargaming and conflict simulation modelling.

Analysis of causal link - example 4

Cause	Shared understanding	Questionnaire or interview (or real-time probes in exercises). Could be tested for by ability to collaboratively plan or direct missions.
Effect	Effects synchronisation	Degree of synchronisation (time, space and impact) of effects. Analysis of information exchanges between units to identify synchronised action. Analysis of activity to identify synchronised effects.
Relationship	A common understanding of the situation, toegther with shared intent, will enable force elements to synchronise effects.	Wargaming, if effects are adequately represented, experimentation (including digitised exercises).

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Some challenging issues

- Impact of decision-making style on Way of Command

- Cultural barriers to rapid changes in Way of Command

- Supporting agile command

    - dynamic management of Way of Command

    - effective synchronisation/orchestration

    - handling complexity effectively

"Prediction is difficult, especially the future"
- Niels Bohr

New platform concepts → Evolved ORBAT

New platform concepts → New operational concepts

Better Information Exploitation → New platform concepts

Better Information Exploitation → New operational concepts

Better Information Exploitation → Better implementation of existing concepts

New operational concepts → Better effects

Better implementation of existing concepts → Better effects

Evolved ORBAT → Better effects

[dstl]

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Conclusions

- Command is a cognitive and social activity

  - non-deterministic

  - role for wargaming, exercise analysis and experimentation

  - the key role of people (in-the-loop) makes Use Cases a vital tool

- Effective Commanders will:

  - understand the key drivers and constraints

  - create/evolve effective structures of authority and responsibility

Potential lines of further enquiry

- Robust control theory and agent-based modelling

  – competing control (command) doctrines

  – variation in ability to collaborate (and dependence on dispersion)

  – variation in range of effects that can be delivered (specialisation)

- Metaphors and analogies

  – emergent co-operative behaviour (swarming)

  – net-centric computing (centrally held resources)

  – these are useful, but their limitations must be recognised

"Real knowledge is to know the extent of one's ignorance" - Confucius

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